EAST BAY
MUNICIPAL UTILITY DISTRICT

February 22, 2007

Mr. Joe Karkoski
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Dr. - #200
Rancho Cordova, CA 95670-6114

Subject: Removal of Camanche Reservoir from the Clean Water Act Section 303(d) List of Impaired Waters for Copper

Dear Mr. Karkoski:

In response to the State Water Resources Control Board's (SWRCB's) December 4, 2006 *Notice of Public Solicitation of Water Quality Data and Information for 2008 Integrated Report – List of Impaired Waters and Surface Water Quality Assessment*, the East Bay Municipal Utility District (District) is submitting the following information concerning Camanche Reservoir located on the Mokelumne River. District staff has evaluated Camanche Reservoir for the feasibility of its delisting. The available data suggest that Camanche Reservoir is meeting water quality standards for copper. Therefore, the District recommends Camanche Reservoir's removal from the Clean Water Act's (CWA's) Section 303(d) List of Impaired Waters for copper.

Camanche Reservoir is located on the borders of San Joaquin, Calaveras, and Amador Counties, on the Mokelumne River (see Appendix 1). 7,622 acres of Camanche Reservoir and 28 miles of the Lower Mokelumne River from the Camanche Dam to the Delta are currently listed as impaired for copper and zinc. Camanche Reservoir was included on the 1998 303(d) List as part of the listing for the Lower Mokelumne River. However, in 2002, at the Central Valley Regional Water Quality Control Board's (CVRWQCB's) recommendation, the SWRCB started listing the two water bodies separately because, according to the CVRWQCB, "listing reservoirs separately from their associated downstream drainages is more appropriate because watershed management strategies (and associated data needs) for reservoirs can be distinctly different from management strategies for the downstream drainages." The extent of impairment at Camanche Reservoir includes the entire lake, defined as extending upstream to Pardee Dam.

The existing beneficial uses of Camanche Reservoir include: municipal and domestic supply (MUN); irrigation and stock watering (AGR); water contact recreation (REC-1); non-contact water recreation (REC-2); warm freshwater habitat (WARM); cold freshwater habitat (COLD); migration of aquatic organisms (MIGR); spawning, reproduction, and/or early development (SPWN); and wildlife habitat (WILD). Numeric and narrative water quality objectives (WQOs) have been promulgated to protect these beneficial uses. US EPA adopted the *National Toxics Rule* (NTR) on December 22, 1992, which was amended on May 4, 1995 and November 9, 1999, and the *California Toxics Rule* (CTR) on May 18, 2000, which was amended on February 13, 2001. The CTR's hardness-based numeric WQOs for the protection of freshwater aquatic life are applicable to Camanche Reservoir, since they represent the most stringent of all applicable numeric limits based on the water body's designated beneficial uses.

Resource extraction is identified as the primary source of copper input into Camanche Reservoir. Several historic copper and gold mines were operated in the watershed. Penn Mine, located near the southeastern shore of the Mokelumne River and Camanche Reservoir, operated intermittently from

1861 to 1953 (Appendix 1). The primary environmental concern associated with Penn Mine was the generation of acid rock drainage. The discharge of low pH water containing copper and zinc impacted the water quality of Camanche Reservoir. Beginning in 1978, the District and the CVRWQCB implemented a series of site improvements to mitigate acid rock drainage discharge to Camanche Reservoir. A large scale Penn Mine Environmental Restoration Project was completed in 1999 that included the excavation and removal of mine waste materials and disposal in a landfill constructed onsite. The restoration project has resulted in an estimated 99% reduction of the copper loading rate to Camanche Reservoir. The District continues to conduct routine inspections and maintenance of the site and perform post-restoration surface water and groundwater monitoring onsite to evaluate restoration effectiveness. The monitoring reports are routinely submitted to the SWRCB and CVRWQCB.

The District's Water Supply Division also routinely monitors Camanche Reservoir's water quality for the following reasons:

- For releases for downstream fish protection;
- For agricultural uses;
- For determining when to turn on the supplemental hypolimnetic oxygenation system at Camanche Dam; and
- As required for complying with regulations applicable to the operation of the Camanche Dam Powerhouse and fish hatchery.

The routine monitoring is performed under two separate sampling programs: Camanche Reservoir – Regulatory Monthly Monitoring and Camanche Reservoir – Routine Monitoring (Monthly). The laboratory service request (LSR) analytical program notes for each of these programs are included in Appendix 2. The notes provide information such as: purpose; overview; sample locations; sample frequencies; analytical notes; sample handling; sample kits; analytical methods; outliers; QA/QC requirements; and reporting requirements.

Sampling is performed by the District's Upcountry staff. Training in sample collection is conducted by District lab staff on an as-needed basis. The collected samples are typically analyzed by the District's own State certified laboratory. In some cases, however, certain samples are analyzed by a subcontracting laboratory. A guide to the lab results' qualifiers can be found in Appendix 3. In addition, Appendix 3 includes the District lab's California Department of Health Services certification, the lab's *Quality Assurance Manual*, and standard operating procedures (SOPs) for: Method Blanks; Determination of Detection Limits Using the (Laboratory Information Management System) LIMS (Method Detection Limit) MDL Module; Required Containers, Preservation Techniques, and Holding Times (for drinking water samples, wastewater samples, and solid wastes and groundwater); and the lab's Tiered Quality Control Levels. Other SOPs are available upon request. Among other information, the *Quality Assurance Manual* describes the quality assurance objectives, sample custody procedures, analytical procedures, calibration procedures, quality control, and data validation, verification, and reporting procedures.

The period of record for the Camanche Reservoir water quality data evaluated for this effort and included in this submittal ranges from January 2001 to January 2007. Even though the Penn Mine restoration was largely completed in fall 1999, some repairs were performed subsequently and the site was not transferred to the District for operation until over a year later. Therefore, 2001 was chosen as a starting point.

It is the US EPA's policy to use dissolved metals to set and measure compliance with aquatic life water quality standards since dissolved metal more closely approximates the bioavailable fraction of a metal in the water column than does total recoverable metal. A total of 654 dissolved copper concentrations were assessed, representing six distinct sampling locations (see Appendix 1)[1]. Data were available for some of these locations at multiple depths. It should be noted that "BOTT" means 3 ft off the bottom, while "SURF" is 3 ft below the surface. The locations of these sampling sites are shown in a map in Appendix 1, where their descriptions can also be found.

The following criteria were applied to the available data to screen out "invalid" or less suitable data points:

1. Where samples from the same location and time were analyzed using two methods, results from the method with a higher detection level (MDL) were removed from further assessment.
2. Results were considered invalid if the dissolved copper result was non-detect (ND) but the MDL was greater than the corresponding criterion continuous concentration (CCC) and criterion maximum concentration (CMC)[2].
3. All copper results without corresponding hardness values were excluded from further assessment because the applicable WQOs are hardness-based.
4. All data deemed not suitable for regulatory compliance reporting by the lab were removed from further assessment.

236 data points remained following screening by applying the above criteria. Since the samples were collected monthly at each location/depth, they were compared to both the CCCs[3] and CMCs[4]. Such a comparison resulted in 27 exceedances of the CCC and 26 exceedances of the CMC. However, since 23 out of the 27 dissolved copper exceedances were greater than their corresponding total copper concentrations, these data points were also considered invalid and removed from this assessment, leaving only 213 valid data points with four exceedances of the CCC and CMC.

According to the SWRCB's *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List*, water segments or pollutants shall be removed from the Section 303(d) List if any of the eleven listed conditions are met[5]. For toxicants, a water segment with a valid water sample size of 213 can have a maximum of 18 measured exceedances and still qualify for removal from the Impaired Waters List, using the binomial distribution delisting criterion. The four recorded exceedances are significantly below the maximum number of allowable exceedances. In addition, these four exceedances were measured at four independent sampling locations quite distant from one another, with the two closest locations, PENN20 and CAMB, over 3,000 ft apart. Therefore, no

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[1] Corresponding total copper data were assessed simultaneously but not used to evaluate compliance with water quality standards.
[2] Such "ND" dissolved copper results were considered invalid even if the measured total copper concentration was less than the corresponding dissolved copper CCC and CMC, even though, in such a case, one could infer the dissolved copper concentration to have a value less than the corresponding CCC and CMC as well, because dissolved copper should be less than total copper.
[3] 4-day averages.
[4] 1-hr averages.
[5] Pages 11 - 13 of the *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List.*

independent sampling location has had more than one WQO exceedance since the beginning of 2001. Lastly, three of the four exceedances occurred before the end of 2002. In the past four years of monitoring, there was only one recorded exceedance out of 97 valid data points.

A Microsoft Excel file containing the aforementioned data is included in this submittal. The file contains three worksheets: *Criteria and Outcomes*; *Screened Data*; and *All Data*. The *All Data* worksheet contains all 654 dissolved copper data points and their corresponding total copper and hardness values that constitute the source data at the beginning of this assessment. The *Screened Data* worksheet contains all data remaining after the above-described screening process. Columns have also been added to the worksheet for the corresponding dissolved copper CCC and CMC values shown in red. In addition, space has been included to mark with an "X" where CCC/CMC exceedances occur or where there are exceedances but the measured dissolved copper concentrations are actually greater than the total copper concentrations. The *Criteria and Outcomes* worksheet contains the above-described criteria used in developing a list of "valid" results and the outcomes of the assessment. Hard copies of all three worksheets have been included in Appendix 4.

As indicated in the LSR notes included in Appendix 2, several other parameters are included in the routine monitoring of Camanche Reservoir, but were not evaluated as part of this particular delisting effort. These data are available to the CVRWQCB upon request.

The District is also submitting data of Chinook Salmon returns up the Mokelumne River from 1955 to 2006. "Escapement" represents success in evading predation, capture, and natural causes of death in the ocean and returning up the Mokelumne River. The graphs in Appendix 5 indicate an overall upward trend in the number of returns during the past 50 years despite some fluctuations due to natural environmental and life cycle factors. These data were collected by the District's Fishery and Wildlife staff for the Mokelumne River Fish Hatchery, which is owned by the District but operated by the California Department of Fish and Game. The counting was conducted at the Woodbridge Dam fish ladder near Lodi for the total number of fish swimming up the river, and again at the fish hatchery, for the number of fish entering the facility. The hatchery is located immediately below the Camanche Dam and is a flow-through facility that receives an annual average of 25.7 million gallons per day (MGD) of water directly from Camanche Reservoir. The Lower Mokelumne River is also fed primarily by Camanche Reservoir. In 2006, according to the California Department of Water Resources, the reservoir discharged an average of 1048.6 MGD into the Lower Mokelumne[6]. The increase in the number of Chinook Salmon returning to the Mokelumne River to spawn is an indicator of the high quality of water in the Lower Mokelumne and Camanche Reservoir.

Based on the available information, the District believes that Camanche Reservoir is meeting water quality standards for copper. The District respectfully requests the removal of Camanche Reservoir from the CWA Section 303(d) List of Impaired Waters according to the guidelines set forth in the SWRCB's *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List*.

If you have any questions, please contact me at (510) 287-0345 or Derek Lee, Environmental Health and Safety Specialist, at (510) 287-1086 or dclee@ebmud.com.

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[6] Reservoir flows are reported to the CVRWQCB in accordance with the requirements contained in NPDES Permit No. CA0082040 (Order No. R5-2003-0153) for the District's Camanche Dam Power House, located directly across the Mokelumne River from the fish hatchery.

CERTIFICATION

I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

John H. Schroeter, P.E.
Manager of Environmental Compliance

Attachments